ABSTRACT OF THE DISCLOSURE

A simulator having a computer-aided design (CAD) programs for verifying algorithms of a shift controller of an automatic transmission. The simulator includes a simulator main unit (a computer) which stores the programs and inputs the algorithm, and pseudo-signal generator which generates pseudo signals including operation signals for the hydraulic actuators. The programs includes first calculating means for calculating outputs of first to third models describing behavior of the engine, the transmission and the vehicle body at a first calculation cycle based on the algorithm and the pseudo signals. A second calculating means inputs the calculated outputs of the first and second models and calculates an output of a fourth model describing non-linear behavior in the second model at a second calculation cycle, shorter than the first calculation cycle, and verifies the algorithm based on the outputs of the first models. With this, it can simulate in real time the behaviors of the automatic vehicle transmission including the non-linear behavior of hydraulic actuators, thereby enabling verification or evaluation of the control algorithm in a real-world environment.